

Claims

1. A method of transmitting a video signal, the method comprising:
removing complementary sets of pixels from alternate frames of a video
5 signal to produce a compressed video signal;
transmitting said compressed video signal;
receiving the transmitted compressed video signal; and
regenerating said removed pixels, by processes selected in dependence on
whether a pixel to be regenerated is determined to be static or moving, to
10 decompress said compressed video signal,
wherein the determination of a pixel being static comprises determining
whether its change with time meets a predetermined threshold criterion or, if said
criterion is not met, whether the pixels neighbouring said pixel are more similar to
each other than to a temporally interpolated value for said pixel.
15
2. A method according to claim 1, wherein said determination of whether the
change of a pixel with time meets a predetermined threshold criterion comprises
calculating the difference between the corresponding pixels of the preceding and
succeeding frames and comparing this difference with a threshold criterion.
20
3. A method according to claim 2, wherein said determination of whether the
pixels neighbouring said pixel are more similar to each other than to a temporally
interpolated value for said pixel comprises comparing, on the one hand, the
difference between a interpolation between said corresponding pixels and the
25 difference between said corresponding pixels and, on the other hand, a spatial
interpolation between neighbouring pixels in the current frame.
4. A method according to claim 3, wherein one or both of said interpolations
are means.
30
5. A method according to claim 1, wherein said neighbouring pixels are the
pixels adjacent to the pixel to be regenerated which have not themselves required
regeneration.

6. A method according to claim 1, wherein the process selected for static pixels comprises selecting the corresponding pixel of the preceding or succeeding frame.
- 5 7. A method according to any one of claims 1 to 5, wherein the process selected for static pixels comprises interpolating between the corresponding pixels of the preceding and succeeding frames.
8. A method according to claim 1, wherein the process selected for moving
10 pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration.
9. A method according to claim 8, wherein the process selected for moving
15 pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration and temporally between corresponding pixels in preceding and succeeding frames.
10. A method according to claim 1, wherein said determinations of pixels being static is performed after said reception of the compressed video.
- 20 11. A method of transmitting a video signal, the method comprising:
removing complementary sets of pixels from alternate frames of a video signal to produce a compressed video signal;
transmitting said compressed video signal;
25 receiving the transmitted compressed video signal; and
regenerating said removed pixels to decompress said compressed video signal,
wherein data representing retained pixels is modified to indicate a
regeneration process for respective removed pixels and regeneration of removed
30 pixels is performed using a process selected in dependence on the state of the data representing the associated retained pixel.

12. A method according to claim 11, wherein the data representing retained pixels is modified to indicate whether removed pixels are static or moving.
13. A method according to claim 12, wherein a bit of said data is set in
5 dependence on whether the associated removed pixel is static or moving.
14. A method according to claim 12, wherein the process selected for static pixels comprises selecting the corresponding pixel of the preceding or succeeding frame.
10
15. A method according to claim 12, wherein the process selected for static pixels comprises interpolating between the corresponding pixels of the preceding and succeeding frames.
- 15 16. A method according to claim 12, wherein the process selected for moving pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration.
17. A method according to claim 16, wherein the process selected for moving
20 pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration and temporally between corresponding pixels in preceding and succeeding frames.
18. A method according to claim 11, wherein the data representing retained
25 pixels is modified to indicate which of a plurality of processes is to be used for regenerating the associated removed pixels.
19. A method according to claim 18, wherein said data is modified in
30 dependence on which of a plurality of pixels and/or temporal and/or spatial averages of pixels best matches the associated removed pixels.

20. A method according to claim 19, wherein the removed pixels are regenerated using the values from the pixels and/or averages indicated by the modification to said data.

5 21. A method according to claim 19, wherein the least significant bits of each component of the data representing a retained pixel form a code indicating said best match.

22. A method of decompressing a video signal, which has been compressed by
10 the removal of complementary sets pixels from alternate frames, the method comprising regenerating removed pixels, missing from the signal to be decompressed, by processes selected in dependence on whether a pixel to be regenerated is determined to be static or moving, to decompress said compressed video signal, wherein the determination of a pixel being static comprises
15 determining whether its change with time meets a predetermined threshold criterion or, if said criterion is not met, whether the pixels neighbouring said pixel are more similar to each other than to a temporally interpolated value for said pixel.

23. A method according to claim 22, wherein said determination of whether the
20 change of a pixel with time meets a predetermined threshold criterion comprises calculating the difference between the corresponding pixels of the preceding and succeeding frames and comparing this difference with a threshold criterion.

24. A method according to claim 23, wherein said determination of whether the
25 pixels neighbouring said pixel are more similar to each other than to a temporally interpolated value for said pixel comprises comparing, on the one hand, the difference between a interpolation between said corresponding pixels and the difference between said corresponding pixels and, on the other hand, a spatial interpolation between neighbouring pixels in the current frame.

30 25. A method according to claim 24, wherein one or both of said interpolations are means.

26. A method according to claim 22, wherein said neighbouring pixels are the pixels adjacent to the pixel to be regenerated which have not themselves required regeneration.

5 27. A method according to claim 22, wherein the process selected for static pixels comprises selecting the corresponding pixel of the preceding or succeeding frame.

28. A method according to claim 22, wherein the process selected for static
10 pixels comprises interpolating between the corresponding pixels of the preceding and succeeding frames.

29. A method according to claim 22, wherein the process selected for moving
15 pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration.

30. A method according to claim 29, wherein the process selected for moving
pixels comprises interpolating spatially between neighbouring pixel which did not
require regeneration and temporally between corresponding pixels in preceding and
20 succeeding frames.

31. An apparatus configured to perform a method according to claim 22.

32. An apparatus according to claim 31, comprising a programmed computer.
25

33. A signal representing program codes for controlling a computer to perform a
method according to claim 22.

34. A signal according to claim 33, comprising an electrical, optical or
30 electromagnetic signal.

35. A data carrier carrying a recording of a signal according to claim 34.

36. A method of decompressing a video signal, which has been compressed by the removal of complementary sets pixels from alternate frames and the modification of digital codes for remaining pixels to indicate whether removed pixels are static or moving, the method comprising regenerating removed pixels,
5 missing from a video signal to be decompressed, to decompress said compressed video signal, wherein data representing retained pixels is modified to indicate a regeneration process for respective removed pixels and regeneration of removed pixels is performed using a process selected in dependence on the state of the data representing the associated retained pixel.

10

37. A method according to claim 36, wherein the data representing retained pixels has been modified to indicate whether removed pixels are static or moving.

38. A method according to claim 37, wherein a bit of said data is set in
15 dependence on whether the associated removed pixel is static or moving.

39. A method according to claim 36, wherein the process selected for static pixels comprises selecting the corresponding pixel of the preceding or succeeding frame.

20

40. A method according to claim 36, wherein the process selected for static pixels comprises interpolating between the corresponding pixels of the preceding and succeeding frames.

25 41. A method according to claims 36, wherein the process selected for moving pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration.

42. A method according to claim 41, wherein the process selected for moving
30 pixels comprises interpolating spatially between neighbouring pixel which did not require regeneration and temporally between corresponding pixels in preceding and succeeding frames.

43. A method according to claim 36, wherein the data representing retained pixels has been modified to indicate which of a plurality of processes is to be used for regenerating the associated removed pixels.
- 5 44. A method according to claim 43, wherein said data has been modified in dependence on which of a plurality of pixels and/or temporal and/or spatial averages of pixels best matches the associated removed pixels.
- 10 45. A method according to claim 44, wherein the removed pixels are regenerated using the values from the pixels and/or averages indicated by the modification to said data.
- 15 46. A method according to claim 44, wherein the least significant bits of each component of the data representing a retained pixel form a code indicating said best match.
47. An apparatus configured to perform a method according to claim 36.
- 20 48. An apparatus according to claim 47, comprising a programmed computer.
49. A signal representing program codes for controlling a computer to perform a method according to claim 36.
- 25 50. A signal according to claim 49, comprising an electrical, optical or electromagnetic signal.
51. A data carrier carrying a recording of a signal according to claim 50.
- 30 51. A method of compressing a video signal, the method comprising removing complementary sets of pixels from alternate frames of a video signal to produce a compressed video signal, wherein data representing retained pixels is modified to indicate a regeneration process for respective removed pixels and regeneration of

removed pixels is performed using a process selected in dependence on the state of the data representing the associated retained pixel.

5 52. A method according to claim 51, wherein the data representing retained pixels is modified to indicate whether removed pixels are static or moving.

53. A method according to claim 52, wherein a bit of said data is set in dependence on whether the associated removed pixel is static or moving.

10 54. A method according to claim 51, wherein the data representing retained pixels is modified to indicate which of a plurality of processes is to be used for regenerating the associated removed pixels.

15 55. A method according to claim 54, wherein said data is modified in dependence on which of a plurality of pixels and/or temporal and/or spatial averages of pixels best matches the associated removed pixels.

20 56. A method according to claim 54, wherein the least significant bits of each component of the data representing a retained pixel form a code indicating said best match.

25 57. A method according to claim 1, including a further compression step before transmission of the compressed video and a complementary further decompression step after reception of the compressed video.

30 58. A method of decompressing a video signal comprising:-
performing a first decompression process on a twice compressed video signal to produce a once compressed video signal; and
performing a method according to claim 22 to produce an uncompressed video signal.